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New York, The Macmillan Company. 1900. Part IV, pp. viii + 354–530, plates xxxiv–liii. 21s.

Biological Lectures from the Marine Biological Laboratory at Woods Holl, 1899. Boston, Ginn & Company. 1900. Pp. 282.

SCIENTIFIC JOURNALS AND ARTICLES.

The American Naturalist for May, opens with a detailed account of 'Marine Biology at Beaufort,' by H. V. Wilson, calling attention to the advantages of this locality as a field of research. J. G. Needham describes 'The Fruiting of the Blue Flag (*Iris versicolor* L.)' noting the effect of civilization in altering its environment. Chas. W. Hargitt presents 'A Contribution to the Natural History and Development of *Pennaria tiarella* McCr.' and R. W. Shufeldt reviews 'The Ornithological Results of the Polar Expedition under Dr. Nansen.' The ninth part of 'Synopses of North-American Invertebrates' is by Nathan Banks, and is devoted to 'The Scorpions, Solpugids and Pedipalpi.' There are numerous reviews of recent literature.

Bird Lore for June has for its leading article, a comparison of 'Song Birds in Europe and America' by Robert Ridgway, which is very favorable to our native birds. William L. Baily describes 'The Kingfisher's Home-Life,' with illustrations of the young at different ages, and Laura G. Page has an article on 'Swallows and Feathers.' Florence Merriam Bailey tells 'How to Conduct Field Classes,' and there is a notice of the course of 'Bird Study at Wood's Holl Marine Biological Laboratory.' There are some interesting notes, and in the Audubon Department an important agreement of the members of the Millinery Merchants Protective Association regarding the importation, manufacture and sale of North American birds, by which the Association agrees not to use any more North American birds after the stock on hand is exhausted, in return for which the Audubon Society and Ornithologists Union are to do everything in their power to prevent the passage of laws interfering with the manufacture and sale of ornaments made from the plumage of barnyard fowl, edible birds, game in season and foreign birds.

SOCIETIES AND ACADEMIES.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of the Academy of Science of St. Louis on the evening of May 23, 1900, the following subjects were presented:

A paper by Dr. Adolf Alt, entitled 'Original contributions concerning the glandular structures appertaining to the human eye and its appendages,' was presented by title.

Dr. M. A. Goldstein read a paper on 'The physiology of voice production,' in which he discussed three essential factors in the production of voice: the motor force, the organ of sound, and the resonators. The essential features presented may be summarized as follows: (1) All elements carefully considered, the best form of breathing applicable to voice production and singing is the rational combination of the costal with the diaphragmatic type. Reserve force in breathing is best attained by deep inspiration, fixation of the distended diaphragm and thorax, and control of these muscles while tone is produced. (2) To facilitate vocalization, the larynx should never be tightly contracted by the muscles of the throat, especially in the production of the registers. (3) On the resonating cavities, their proper conformation and position in relation to the vibrating cords and larynx, depend the quality and timbre of the voice, so that the careful and proper placing of tones is perhaps the most essential factor in voice production.

Professor F. E. Nipher read a short communication on the zero photographic plate, to which reference was made at the meeting of May 7th, and in his paper published as Vol. X., No. 6, of the Academy's Transactions.

The zero plate is one upon which a photographic image has been made, but which will develop no image in a bath placed in light of given candle power, at a distance of one meter from the source. For example, if the developing bath is twenty centimeters from a sixteen candle lamp, a Cramer isochromatic plate, such as is called 'instantaneous,' held for ninety seconds at a distance of one meter from the lamp, will be a zero plate. With an opaque stencil over the plate when placed in a printing frame, during the exposure, there will develop a positive of holes through the stencil, if the

exposure is longer, and a negative if the exposure is shorter. The bath used in the above illustration must be weak and cool.

If a fresh plate is exposed in our camera with full opening to a brilliantly lighted street scene for one minute, it will develop as a positive in that same bath. This time can be somewhat reduced, but the least time needed has not yet been determined. It is evident that part of this minute is used in producing a zero plate. It is furthermore clear that different parts of the plate will arrive at the zero condition at different times. The exposure may be arrested at a time when the strongly lighted white background of a sign-board will develop white as a positive, and when the black letters will also show white as a negative.

It has been found that when a plate is uniformly exposed over its whole surface to the extent that nothing would have developed had it been covered by a stencil, this plate may then be placed in a camera and exposed in the ordinary way, and a perfect positive will develop in the bath to which it has been adapted. This preliminary spoiling of the plate for developing a negative is a very advantageous preparation for taking a positive. It shortens the time of exposure, and ensures that a positive shall be obtained over all parts of the plate. It is not yet known how short the camera exposures may be made, but the present indications are that they will be as short as those now made in the taking of negative pictures.

It is currently believed by photographers that in a positive plate the object has 'printed its picture' upon the plate. This is an entire misconception of the process. It is true that in an exposure of long duration an image shows on the plate before it is placed in the bath. But this image is blackest where the light has acted most. It is a negative. This picture disappears in the developing bath when illuminated. The plate becomes perfectly clear. The positive picture then develops, exactly as a negative would under ordinary conditions.

Mr. J. B. S. Norton presented some notes on the flora of the southwestern United States. Maps were shown indicating the parts of this region and others not well represented in herbaria, as compared with other sections of the country. Among other interesting features of the Southwest was mentioned the production of many different forms or closely related species in the isolated mountains surrounded by deserts. This was compared with insular conditions and illustrated by the mountain forms of Euphorbia. Specimens of some new species from southwest Missouri were also shown.

Two persons were elected active members of the Academy.

WILLIAM TRELEASE,
Recording Secretary.

NEW YORK ACADEMY OF SCIENCES.
SECTION OF BIOLOGY.

AT the regular meeting of May 14, 1900, Professor F. S. Lee, presiding, the following papers were presented:

'Some Chemical Notes on the Composition of the Cocoanut,' by J. E. Kirkwood and Wm. J. Gies.

The authors have carried on qualitative work on the ungerminated nut, preparatory to a study of the digestive processes during germination. The chief constituents are cellulose and fat. Some soluble carbohydrate is present, beside globulin and proteose, but no albumen or pepton. Only amylolytic ferments have so far been found. The milk of the nut is normally acid, probably due to acid phosphate. It contains an earthy phosphate, reduces Fehling's solution, sours on standing, and acquires much the odor and physical appearance of soured cow's milk. It shows only small quantities of proteid and fat.

The meat of the average nut contains from two to three grains of globulin, which may be obtained in crystalline form. The authors have made three preparations by the usual methods. The nitrogen averages for these were 17.91%, 17.81%, 17.68%. The ash for the same, 0.13%, 0.41%, 1.05%. From the meat of twelve nuts it was possible to separate a little more than three grains of proteose by the usual method. The average of three closely agreeing determinations of nitrogen was 18.57%; of the ash it was 1.71%. The quantitative relationships of these and other constituents will be subjects of combined investigation.

Dr. Curtis drew attention to the irritation of the mucous membrane of the bladder and urethra caused by drinking too freely of cocoanut milk. Dr. Gies, in answer to a question, stated that the food content of the cocoanut is small.

'The significance of Carbohydrates in Muscle,' by Frederic S. Lee and C. C. Harrold.

This work is a continuation of the senior author's study of the nature and causes of muscle fatigue. Of the two supposed causes of fatigue, loss of substance necessary to contraction and poisoning by so-called fatigue products, the present work deals with the former. It is well known that the drug phlorhizin causes the removal of the carbohydrates from an organism to which it is administered. The authors find that it induces decided evidences of fatigue in the muscles of fasting cats. A well phlorhizinized muscle is comparable to a normal muscle in the late stages of fatigue. This effect seems to be due, not to a specific action of the drug on the protoplasm of the muscle cells, but to the loss of carbohydrate from the muscle. This conclusion is rendered probable by the fact that when an animal has been put well under the influence of phlorhizin, the administration of sugar (dextrose) counteracts the effect of the drug, removes the evidences of fatigue and restores the muscle. It seems probable that the loss of carbohydrate is an important factor in the early stages of muscle fatigue.

Incidently some observations on rigor mortis have been made. A muscle well under the influence of phlorhizin may begin to go into rigor five minutes after death and rigor is complete very early. This confirms the conclusions of others that there is a close connection between rigor and carbohydrate. A muscle irrigated with dextrose is capable of giving fully as many contractions as, or even more than, a normal muscle without dextrose.

The election of sectional officers resulted in the appointment of Professor C. L. Bristol, of the New York University, as Chairman, and Professor F. E. Lloyd, of Teachers College, as Secretary for the ensuing year.

F. E. Lloyd,
Secretary.

TORREY BOTANICAL CLUB.

At the meeting of Wednesday, April 25, 1900, the paper of the evening was by Mr. David Griffiths, 'Some Saprophytic Fungi.' Mr. Griffiths described the mechanical devices employed by the genera of the Pyrenomycetes for the distribution of their spores. The genera described with reference to this point were *Podospora*, *Sordaria*, *Deletschia*, and *Sporomia*.

In *Podospora* the ascus elongates to the apex of the perithecium, where it is ruptured and the spores are scattered.

The genus *Sordaria* distributes its spores in the same manner but with a definite point at which the ascus ruptures.

The methods of ejection in the case of the other two genera, are very similar, except in the details of the rupture of the internal membrane of the ascus; here the membrane elongates instead of the ascus itself.

The meeting of Tuesday, May 5, 1900, was held in the lecture hall of the Museum building at the New York Botanical Garden, with a lecture by Dr. M. A. Howe, on 'The Hepaticæ.' The term *Hepaticæ* was used in a restricted sense, excluding the Anthocerotes.

After a few introductory remarks in regard to the position occupied by the *Hepaticæ* in the vegetable kingdom, the speaker reviewed the life-history of a few of the typical forms, the principal details of structure being exhibited by aid of lantern slides. The slides also showed the habit characters of various local species and of some from the Pacific coast.

Though the *Hepaticæ* are on the whole inconspicuous, and attract little attention except from the botanical specialist, they are nevertheless extremely diversified in structure and often very beautiful in form. Their chief interest, however, to the naturalist lies in the fact that many of them throw light upon questions concerning the evolution of the plant world. The first plants, without doubt were purely aquatic in habit of life. The *Hepaticæ*, though favoring moist situations as a class, range from species which are wholly aquatic to those which have become adapted to quite arid conditions.

As a group they may be considered to be the lowest of the chlorophyll-bearing land plants.

J. K. Small,
Sec'y Pro. Tem.